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Garden and Forest.

Among the contents of next week's issue (No. 165) will be the following articles:

Recent Forest-legislation.

EDITORIAL.

The Distribution of Some Kansas Trees.—II. (Illustrated.)

By S. C. MASON.

Planting about Piazzas. (With plans.)

Hardy Shrubs for Forcing.

By J. G. JACK.

The paper will contain an illustration of Populus monolifera, from a photograph, and Plans for planting about house-foundations.

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A Flower-Garden for New York.

THE city of New York was startled a few weeks ago by the announcement that a bill had been passed through one House of the Legislature which authorized the covering over of the old reservoir on Fifth Avenue and the creation of a so-called air garden on the spacious floor thus provided. Fortunately this scheme was thwarted by the indignant protest of the people, but it calls attention to the question. What shall be done with this reservoir when the new system of water-supply shall render it no longer needful? In one sense this is a purely local question, but it has aspects which are of interest to all who care for the proper adornment of public grounds in cities. No single style of planning and planting is adapted to areas of all sizes and surroundings, and this space seems to offer an admirable opportunity for a special type of garden design.

Every New Yorker, and every one who has visited the city, is familiar with the appearance of the reservoir, a substantial stone structure 500 feet square. It has no remarkable features as a work of architecture, and yet there is no excuse for tearing it down for the mere purpose of getting rid it, for it is on the whole a pleasing and rather effective structure in appearance, and it gains interest and value because it is unlike everything in its neighborhood. Its simplicity in line and mass contrasts refreshingly with the elaborateness of the adjacent buildings, and its low sky-line agreeably breaks the long high perspective of the avenue and admits an unwonted amount of light and sunshine. And then, too, it is bordered by a strip of grass with well-disposed shrubbery and vines, so that it is in summer a truly welcome sight. It is better, therefore, that the reservoir should remain as it is, even if it were entirely useless, than that it should be replaced by another building of any kind.

Standing as it does between the small area known as Bryant Park and Fifth Avenue, there has been a considerable desire expressed to have it demolished for the purpose of extending this park. Of course an increase in the number and size of our urban pleasure-grounds is always worth considering, but, after all, the increase in the area of Bryant Park may be too dearly purchased. A mere extension of this park in its present character is hardly desirable. It is not as though this were in a crowded quarter of the city and far removed from Central Park. In such a case the sweeping away of any building for the creation of a park of any kind to enable the thronging population to find a green spot would be desirable. But this park is but a short distance from Central Park, and it is never crowded with the class of persons who throng Tompkins Square and the Battery Park. The only justification for the expense of removing one of the few structures of an earlier time that are worth preserving would be the assurance that the space it fills could be converted into a garden of genuine beauty that would be an appropriate ornament to our finest thoroughfare.

A mere duplication of Bryant Park would not accomplish this end. No park could be more deficient in design, dignity and charm. It is a commonplace assemblage of asphalt walks, badly shaped grass-plots and a monotonous planting of Silver Maples. It is not a formal park nor yet a bit of landscape, like Mount Morris Park in Harlem, and it is valuable only as an open and shady place and not as a delight to the eye of the passer. But if the reservoir should be removed there would be no need that its area should be treated in the same way as Bryant Park. What we should like to see here would be a great flower-garden, similar to those which ornament many foreign towns. The fact that it is slightly above the level of the street and of Bryant Park would give a better chance for good results in this direction. The space could be laid out with broad, straight main walks, and minor ones, either straight or harmoniously curved, to form grass-plots of graceful outline. Then the main walks might be planted with avenues of small trees of a single kind, and symmetrical groups of shrubs could be formed on the borders which would have a succession of flowers throughout the season. The lawns could be edged with long narrow beds of hardy flowers, which we have often described under the name of French Parterres, and in appropriate situations, such as at the intersections of the paths, could be placed pattern beds of the most brilliant hues. This would make a pleasure-ground unique in this city and admirably adapted as an ornament to the avenue and a delight to the eyes of the public. It is constantly insisted by those who wish some excuse for the intrusion of formal flower-beds into pastoral landscapes that the public like nothing so well as flowers. In one sense this is true, and such a space as this would furnish an excellent opportunity to offer flowers in profusion, and also in a most beautiful and appropriate way. Of course, other things would be needed besides the planting of flowers to make the most of this opportunity. The cheap railing on its boundary should be replaced by a handsome stone balustrade, over which the interesting panorama of the avenue could be watched from appropriate seats, and beyond the main central entrance a sculptured fountain could lift its constant streams of water, while minor fountains or beautiful statues could be placed here and there.

There is no good reason why a garden of this sort could not be made one of the most attractive and artistic spots in the city. Indeed, some surroundings of the character found here are essential to decorative gardening of the best type. The canons of good taste would exclude such rigid and geometrical planting from landscapes like those in Central Park, because it would be impossible to reconcile such an artificial work with the free and natural design of the park. The two motives would inevitably conflict with and contradict each other. A flower-garden in a stretch of greensward would interrupt its unity and rob it of the breadth and repose, which are its highest charm. And, on the other hand, an expanse of turf with an irregular border of shrubs or trees would make a peculiarly inappropriate setting for a formal flower-garden, and neutralize to a great

extent its beauty of form and color. But a geometrical design is not injured, but improved, by confinement within the straight lines of streets and blocks of buildings, and areas with such sharply defined, rectilinear boundaries furnish unequaled opportunity for the display of decorative garden art. The floral flags and banners and pictures, with which too many of our public parks have been adorned, are simply abominations. But if some artist with genuine creative faculty and a refined sense of color could be found to make a design for strictly ornamental planting, as distinguished from natural planting, adapted to the area where the reservoir now stands, he would confer a boon upon New York, and offer an object-lesson well worth study and imitation by other cities.

The Sugar Maple.

WE have already published an illustration of a New England Sugar Maple, but good tree-portraits are not so abundant that an apology is needed for offering the one which appears on page 175. This Maple, too, is a universal favorite among our native trees, and one which planters never tire of using and no one ever tires of seeing in northern fields and waysides where it is at home. When it is young the Sugar Maple, although it is always a clean and thrifty-looking tree, lacks something of dignity and individuality. It is the general habit of this tree, instead of forking into large limbs, to throw out from a central stem many comparatively slender branches, the lower tiers of which rise at a slight angle above the horizontal, while those of successive years become more and more upright. As these branches grow out to about the same length with abundant foliage at their extremities, they form a tree of perfectly symmetrical contour, usually egg-shaped, and although the foliage is bright and cheerful its smooth and regular surface presents too little variation of light and shadow. These long and slim branches are easily moved, however, so that the tree has a sprightly and almost sparkling appearance in the sunshine when its leaves are stirred by the gentlest breeze. As it grows on to greater size, and the extremities of these numerous branches are farther apart, breaks begin to appear in the masses of foliage, and here and there some one of these lateral branches will assert itself and outgrow its neighbors until the entire outline of the tree is changed. The top often becomes broad and nearly flat, the sameness of the contour vanishes, and deep shadows give it a dignity of expression which it altogether lacks when young.

In the illustration the tree on the right has passed its prime, as can be seen by its comparatively scant foliage, which opens so as to show its main stem. Dead limbs also appear at the summit and on some of the longer side branches. Trees which are standing alone in pastures often die before their time, because cattle resort so much to their shade, and trample the ground beneath their branches. Very often, too, they are struck by lightning. Sometimes a shock of this kind is apparently slight, and the stricken tree seems at first to suffer no harm, but generally, after lingering a year or two, it dies outright.

The more distant tree on the left of the picture, and apparently a larger one, is still in full vigor, and represents an admirable specimen of its kind. It is growing on lower land, and, probably, has been better supplied with moisture than the one on the little hillock.

The Sugar Maple is a beautiful tree at all seasons. In early spring, when the greenish yellow flowers suddenly burst forth with the first leaves, the tree has an appearance altogether distinct from that presented by any other. Standing in the sunshine, a tree in full flower seems enveloped with a luminous mist, and is an object of striking beauty. Later in the season, its light green and very abundant foliage give it what has been aptly termed a peculiarly sunny expression, and it stands for the very type of cheerfulness among trees. In the autumn none of our trees blaze with brighter or more varied colors, and in the winter its light, ash-colored bark is a pleasant relief from the more sombre hue of other native trees.

We have nothing to add here to what we have often said about the value of this tree for timber and for fuel, and for its sugar product, but merely wish to say, that it was a sagacious popular instinct which selected this as one of our best trees for ornamental planting, and that few trees can excel it in situations where it will thrive. In some of the old places on the Hudson River long avenues were planted with it, three-quarters of a century ago, and some of them are now worth a long journey to see.

How We Renewed an Old Place.

III.—A BABY FOREST.

WE know that mothers love best those children who give them the most trouble, and it must be on some such principle that this barren hill-side of ours wins our best affections; for, as we cultivate its seemingly thankless surface, while it disappoints and resists our loving efforts, all the more there grows in us a tender comprehension of its hidden beauty, a wider sense of its possibilities, and a greater patience with the slow processes by which it is to be restored to vigor and productiveness.

We sympathize with its struggle for self-adornment, poor, barren, ugly thing. The cold, northern slope comes slowly to life, turned away as it lies from the fostering sunlight. When the plain and swale are bright with the hues of spring, the uncut grass upon its side is still brown and withered; it seems to dread awakening from its winter sleep, but at last it begins to star itself over with blossoms of white Saxifrage, and anon it grows purple with Bird's-foot Violets, sending out in the sunshine that soft, fleeting perfume which is a hint of the riper fragrance of their English cousins.

At this season, too, the exquisite wild Columbine decks it with earrings of coral and gold, which the country children call meeting-houses from their steeple-shaped horns, and over it the all-pervading Daisy waves its white and yellow blossoms sturdily in the wind, while the wild Briers put forth their roses, and the Dog's-bane its fragrant cymes, till the Golden-rods and Asters come at last to hide its barrenness with their royal splendor. And all the while there are short, thin grasses, of tender greens and browns, clothing it humbly, while spots of vivid emerald moss indicate the presence of hidden rivulets that feed a living spring that lies at its foot.

In this spring is the possibility of a water garden, of which there is already a beginning. All summer long you can see shining there the blue eyes of great Forget-me-nots, the seeds of whose forebears were brought, long ago, from stately Fontainebleau by a gentle artist, who planted them by his own brook-side, whence they have overrun and made famous the Hingham Meadows, their bright blossoms, like scattered fragments of the sky, gleaming among the rushes, and affording a valuable industry to the small boys who sell them at the railway station as you pass. In addition to these continuously blooming flowers, there are Pussy Willows and white Violets in the spring, and in the late summer the Arrowhead lifts its sculpturesque blossom and fine outlined leaf from the water, and the Cardinal-flower uprears its scarlet spikes amid the blossoms of stately grasses. Some day we hope to see a Pond Lily asleep upon its surface, and if the Lotus-flower would but brook our rigorous winters, we should add one to the collection.

At the foot of the hill, at each end, is a clump of White Birches, ladies of the woods that have strayed from their home, and lost themselves on this waste, and rustle their thin leaves timorously, bending their slender white stems as the sea-blasts strike them. Now that we have stopped mowing and pasturing, we find clumps of Bayberry and Choke-cherry bushes coming up under the tumble-down old rail-fences between us and our neighbors, so that these last are already high enough to shade the boys when, tired and hot with play, they throw themselves upon the ground under their grateful protection. For on the summit of the hill there is level space enough, inside our line, for a tennis-court, from which you can look for a mile across the meadow to the tree-clad hills beyond, and the clustered houses and masts of the harbor, half-buried in trees, and seek for the blue line upon the high horizon that indicates the sea.

Straggling paths, worn by careless feet, lead up the hill-side in those pleasant, meandering ways that indicate the foot of man, and, in imagination, we see them shaded by the Birches

and Pines that we have hopefully planted along the borders; for, in moving our trees with the surrounding sod, we usually brought along these close companions—the Pines and Birches being so married, in most instances, that it seemed a cruelty to separate them.

Hope and faith are qualities that find splendid exercise in tree-planting, and no pursuit can be more unselfish; for, as we watch the tardy growth of our plantations, it is with the stern conviction that other eyes than ours will see the waving of tree-tops above them, and far younger feet that will tread the fragrant woodland-ways when they are at last carpeted with Pine-needles. It is by this spirit that we become one with Nature, sharing humbly in her patience, in her vast unending plans, in her bountiful provision for the future. What better boon to the race can a man leave than a wood that he has planted, in which a future generation may walk and bless his name? Or, if the name be forgotten, there shall abide the forest-blessing, ever beneficent, the mother of springs that fertilize the plain, a shelter to the weary, a delight of the eye, a source alike of profit and pleasure while it endures.

We have friends who scoff when we take them to walk in our forest, and beg them not to step on the Oaks; but, to us, these tiny seedlings, so feeble and unimportant, are personalities that we have cherished through successive seasons, feeding them when hungry, giving drink when dry, grieving when their tender leaves, scorched by too fierce a sun, withered and fell, and rejoicing when, under the cool rains of September, their little bare stems put forth fresh crowns of leaf-buds. Much comfort can be taken in the fact that an Oak once rooted will not wholly perish, but some day conquer even the most obdurate of soils. Like good seed sown in the heart of a child, the storms and sunshine of the world may seem for a time to wither the plant to the ground, but in the end the beauty and power of deep-rooted character will prevail and bear fruit.

We have in our experiments endeavored to make use of such materials as lay at hand, though well aware that nurseries and gardens could have helped us on our way more rapidly. But dealers in trees are expensive luxuries, and our object has been partly to see what can be done without much money, and with only a moderate amount of labor. Our experience has shown us, what the books on forestry told us in the beginning, that sowing seeds and nuts is far less satisfactory than transplanting small trees; but we have had the entertainment of proving their statements for ourselves, and find our compensation in such trifling results as we have achieved. The Pine-seeds, which we shook from the cones in the autumn, and planted before they had time to dry, came up profusely enough in little clusters, but so tiny and weak, that it is wonderful that they are ever discovered even in the thin grass of the hill-side, which we leave near them to afford shade. They make, under these conditions, a sturdy little growth so long as the weather is cool and moist, but are apt to disappear altogether in the month of July. Any small tree, that one can pull up by a wayside, will make better returns for a little attention than these slow-growing mites from seeds.

Such White Birch-seed as we have sown, either because we did not know when to gather it, or whether it came from the wrong tree, has failed to come up at all; but in the sandiest and most uncomfortable part of the hill we find little seedlings that have come up of themselves from the trees at the foot, so that we are fain to confess that Nature understands her business better than we do.

The very small Pines, a few inches high, of which we have set a large number on the rear of the hill, do not grow as well as the larger ones, and are more apt to die. So far our experience leads us to prefer good-sized trees of all kinds for transplanting, rather than small ones, the larger tree seeming to have more vitality to come and go upon until new roots are formed, and it has become adapted to its new conditions.

We have planted various kinds of acorns in great profusion, but the Mossy-cup and the Chestnut Oak seem to thrive best in this waterless soil. The White and Red Oaks seem to require enriching to hold their own at all, and Maple seedlings, which come up promptly, yield to the first drought, though very small transplanted trees live on. Hickory-nuts, though slow in growth, are not vanquished by the conditions, and little yearling Chestnuts, transplanted and dug about, flourish bravely.

From a friend in town whose English Walnut-tree has borne profusely after the recent warm winters, we have obtained fresh nuts, which, promptly set, have germinated and given us fine little shoots in one season. This tree is a more rapid grower than any of our native nut-trees, and so far has stood the winters, but we have had no weather below zero here since 1887, and cannot answer for the effect of an old-fashioned winter. The field mice have a great predilection for them, and gnawed our largest one down to the root a year ago, but it came up again in the spring with redoubled vigor, and made up for lost time.

Small Beeches, dug up by the road-side, and put into holes prepared for them in the side of the hill, have thriven without much attention, and make a favorable growth; but some Ailanthus-trees from a nursery, in spite of Horace Greeley, have refused to do anything at all. In the swale at the foot of the hill, where the soil is deep and moist, all trees flourish. English Oaks grow rapidly from acorns, and we have a fine group of Chestnuts, transplanted when fifteen feet high, that grow superbly after being cut back sternly when set. Though much beset by insects, they are now firmly established, having been planted in the autumn of 1888. In this same moist, rich soil we have also had very good success with that difficult tree to move, the Hemlock; and the Tulip-tree and the Mulberry also flourish, though the tender young branches of the latter suffered after the last two warm winters, dying back badly. How they will have borne this moderately cold one remains to be proved.

Hingham, Mass. *M. C. Robbins.*

The Sap and Sugar of the Maple-tree.—I.

IN October, 1890, and January, 1891, *The American Anthropologist* published two interesting papers—one on "The Indian Origin of Maple-sugar," by H. W. Henshaw, and the other on "The Maple amongst the Algonquins," by A. F. Chamberlain.

These accomplished investigators have thus opened up a new subject of Forestry which may interest some readers of Garden and Forest. They recognize the really sedentary condition of the various Indian tribes, and the fact that, while their supplies of animal food were derived from fishing and hunting for animals and men, they really depended for their daily bread more upon the fruits of agriculture carried on by the Indian squaws than on any other single source. So skilled were they in cultivating the staple grain of America, the priceless maize, that the early colonists were their willing pupils in learning the art; and to these Indian savages, in many times of famine and distress, the colonists on all the Atlantic coast were obliged to appeal for supplies of corn from stores garnered up in sacks, or baskets and boxes made from the bark or wood of forest-trees, or in holes in the ground.

However little practical interest the result of this inquiry may have, it has been thought of some importance to the student of history to know what point upward the Indian race had attained in the arts of common life and in the chemistry of nature as related to their food-supply.

From the great knowledge of the Indian as to all edible products of America, as he had often to draw a part of his subsistence from the bark and wood of trees, the *a priori* presumption of the discovery of the properties of Maple-sap by him is, as stated in these papers, entirely in his favor; yet the question of fact is to be finally decided by appeal to two classes of evidence, the historical and the linguistic, and the two corresponding lines of argument. The rarity of specific reference in the early annals of discovery to the making of sugar by the Indian is accounted for by several causes, among which is the fact that the earliest navigators and explorers were seldom chroniclers. Coming to new shores peopled by savages, they rarely went far into the interior. They generally lived on their ships, or, if on shore, drew from the ships their supplies; while the great staples of such trade as they sought and could carry on with the natives were almost wholly furs of various kinds, and fish.

The shores of the sea and the tidal streams were not the common home of the Sugar Maple. And so far as the forests were concerned, the aspirations of these bold navigators were more than satisfied by the majestic Pines for masts and spars, the other splendid timber-trees for building ships, and the rich sources of turpentine and tar which everywhere met their eyes. Besides this, their passion for conquest often led to fierce contests with one another for territorial aggrandizement, so that little heed was given to questions of plants or food-products on shores where at almost every step they were liable to meet a savage barbarian, or a but little less ferocious wild beast.

On the other hand, the missionaries, to whose habit of writing we are indebted for many of the early notices of trees and fruits, were in no respect naturalists, and their descriptions of natural products are extremely incomplete, as well as few and far between. The very early records are indeed few, but careful research has been rewarded by the statements of Lescarbot,

Le Clercq, Denys and Boucher, which are earlier than any noticed in the *Anthropologist*, with the exception of Sagard's. Yet, that readers of Garden and Forest may know the character of the evidence which exists, a résumé of the statements of the principal authorities adduced is given, mainly in chronological order, the quotations having been verified by reference to original works.

The earliest record the writer has yet found is that of Lescarbot (1606–7), a lawyer of Paris, who from love of adventure came to New France as a friend of Poutrincourt in 1606. He gives some description of the New World and its Indians, tells of their great endurance, and explains the resource they found in the sap of trees for refreshment and strength in their hunts and long journeys through the forests. He says:

"Ils aussi . . . entreprendont d'aller vingt, trente et quarante lieues par le bois sans rencontre ni sentier, ni hotellerie & sans porter aucuns vivres. S'ils sont pressez de soif ils ont l'industrie de succer les arbres, d'ou distille une douce et forte agréable liqueur, comme je l'ai experimenté quelque fois."*

That Lescarbot refers here to the sap of the Maple-tree there seems no reason to question, as in the summer of 1606 he met with Erables (*Acer rubrum*) and Sycamores (*A. barbatum*) in the forests around Port Royal.†

The declarations of Père Sagard (1623–29), when with the Hurons, as to the use of the sap of trees, are to the same effect. He says:

"Au temps que les bois estoient en sève nous faisions parfois une fente dans l'escorce de quelques gros fouteau, et tenans au dessous une escuelle, nous recevions le jus et la liqueur qui en distillait, laquelle nous servoit pour nous fortifier le cœur lorsque nous nous en sentions incommodez."‡

Sagard also expressly confirms the statements of Lescarbot as to the use by the Indians of the sap of trees to restore their strength and relieve their thirst when on expeditions through the forests, and affirms the adoption of this custom by the French themselves when the trees were in sap.§

Monsieur Nicolas Denys, Gouverneur, Lieutenant-Général pour le Roi (1634–1671), thus writes of the Maple:

"L'Erable est encore un bon bois: . . . cet arbre-la a la sève differente de tous les autres; ou en fait un boisson tres-agreable à boire, de la couleur de vin d'Espagne, mais non si bonne; elle a une douceur qui la rend d'un fort bon goust, elle n'incommode point l'estomac, elle passe aussi promptement que les eaux de Pougues; je crois qu'elle serait bonne pour ceux qui ont la pierre. Pour en avoir au Printemps et l'Automne que l'Arbre est en sève, l'on fait une entaille profonde d'environ un demy pied, un peu enfoncée au milieu pour recevoir l'eau, cette entaille a de hauteur environ un pied, et à peu prés la mesme largeur; au dessons de l'entaille à cinq ou six doigts on fait un trou avec un vrille-brequin qui va répondre au milieu de l'entaille où tombe l'eau: on met un tuyau de plume ou deux bout à bout si un n'est assez long, dont le bout d'en bas répond en quelque vaisseau pour recevoir l'eau; en deux ou trois heures il rendra trois à quatre pots de liqueurs. C'est la boisson des sauvages et mesme des François qui en sont friands."‖

Pierre Boucher (1663), Gouverneur des "Trois-Rivieres," who dedicated his work to Monseigneur Colbert, Intendant des Finances, says, in writing of the trees which grow in New France: "Il y a une autre espèce d'arbre, qu'on appelle Herable, qui vient fort gros et haut. . . . Quand on entaille ces Herables au Printemps il en degoutte quantité d'eau, qui est plus douce que de l'eau détrempée dans du sucre; du moins plus agreeable à boire."¶

After Boucher, Père Christien Le Clercq, a Recollect Missionary (1675–91), relates the experience of the missionaries in the use of Maple-sap. He says: "Nos viandes ordinaires estoient de même que celles de nos sauvages, c'est-à-dire de la Sagamité fait à l'eau avec de la farine de bled d'Inde; des citrõnilles et des pois, ou nous mellions pour y donner quelque goût, de la marjolaine, du pourpier, et d'une certaine espece de baume, avec des petits oignons sauvages que nous trouvions dans les bois, et dans la campagne. Notre boisson était l'eau de ruisseau, qui coulait au pied de nõtre maison, et si dans le temps que les arbres étoient en sève quelqu'un de nous se trouvait indiposé, ou ressentoit quelque debilité de cœur nous faisons une fente dans l'écorce d'un erable qui distilloit une eau sucrée qu'on amassoit avec un plat d'écorce, et qu'on beuvait comme un remede souverain; quoi qù á la verité, les effets n'en fussẽt bien considerable."*

Père Le Clercq in another work is more explicit, and says: "Quant à l'eau d'erable qui est la sève de l'arbre même, elle est egalement délicieuse pour les Français et les Sauvages qui s'en donnent au Printemps à cœur joie. Il est vrai aussi q'elle est fort agréable et abondante dans la Gaspasie, car par une ouverture assez petite, qu'on fait avec la hache dans un érable, on en fait distiller des dix ou douze pots. Ce qui m'a paru assez remarquable dans l'eau d'érable, c'est que si à force de la faire bouillir on la reduit au tiers, elle devient un veritable syrop, qui se durcit à peu prés comme le sucre, et prend une couleur rougeâtre. On en forme des petits pains† q'on envoie en France par vareté, et qui dans l'usage sert bien souvent au defaut du sucre Français. J'en ai plusieurs fois melangé avec de l'eau de vie, des clous de girofle et de canelle; ce qui faisoit une espece de rossoli fort agreable."‡

Providence, R. I. *William D. Ely.*

New or Little Known Plants.

Lælia anceps, var. holochila.

Among the multitude of varieties of *Lælia anceps* which have at different times appeared I have never before met with one having a perfectly entire lip, as has the present one. Indeed, the aspect of the flower is so different that, apart from the plant, it is doubtful if it would be recognized by many people as belonging to *Lælia anceps* at all. Early in the present year a single flower was sent to me by the conductor of Garden and Forest, from the collection of Mr. F. L. Ames, of North Easton, Massachusetts, with the information that the plant was purchased in June, 1888, from the Liverpool Horticultural Company, with a batch of other plants, as *Lælia anceps morada*, and that, with this single exception, the lot proved true to name. It flowered for the first time in December, 1889, carrying two spikes, and again the following year with five spikes. The plant has thirty bulbs and six leads. My first knowledge of this variety dates from December 7th, 1889. On that morning two flowers arrived from two different sources. One was from the Liverpool Horticultural Company, with a note from Mr. John Cowan, the manager, that it was a very distinct variety, at first sight looking like a deformed flower, but that there were two plants with flowers exactly alike. The other flower came through Messrs. Hugh Low & Co., of Clapton Nursery, who had received it from Mr. W. Sherwin, The Gardens, Asmaston Manor, Ashbourne.

Mr. Sherwin remarks that when the first flower opened he thought it some accidental freak, but a second plant on flowering proved exactly the same. A little later a pseudobulb and leaf were sent, also a peduncle, all of which were quite normal in character. The peculiarity of this variety is almost confined to the lip, which is elliptical-lanceolate in shape, over two inches long by three-quarters of an inch wide, and more like a petal than a lip. It is, however, different from the petals, both in shape and color, being light purple, with a nearly white disc, and some yellow at the base, while the petals are almost identical with the sepals in shape, and all pale lilac in color. The column is nearly, but not quite, normal. I believe this variety represents a peloriate condition of the plant, which has become fixed or permanent, and thus bears the same relation to *Lælia anceps* that *Uropedium Lindenii* does to *Selenipedium caudatum*. That the peculiarity has become fixed seems pretty evident, but whether it could be reproduced from seed is rather doubtful. I do not know the origin of Mr. Sherwin's plants, but should not be surprised to find that the whole of the plants under mention are subdivisions of one original clump, and from the same importation. If, however, we must consider it a monster, it is only such in a botanical sense, for it is a decidedly handsome garden-

* Lescarbot, Lib. vi., Cap. xvi., p. 865. Paris, 1618.
† Lescarbot, Lib. iii., Chap. xxiv., p. 852. Paris, 1609.
‡ Sagard, "Le Grande Voyage du Pays des Hurons," pp. 102–3 Paris, 1632.
§ Sagard, idem., p. 126.
‖ Histoire Naturelle des Peuples, des Animaux, des Arbres et Plantes de l'Amerique Septentrionale, Vol. ii., Chap. xx., pp. 316-7-8. Paris, 1672.
¶ Histoire veritable et naturelle de la Nouvelle France, 44-5. A Paris, 1664.

* Etablissement de La Foy. Par le Père Christien Le Clercq, Vol. i., 252-3. A Paris, 1691.
† It is brought into Quebec to-day in "petits pains" and little cornucopias of birch-bark.
‡ Nouvelle relation de la Gaspesie, Chap. vi., 124-5. A Paris, 1691.

plant, and the most distinct, if not the rarest, variety of *Lælia anceps* in existence, and a marked contrast with the ordinary form.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

London Letter.

Snowdrops.—At a late meeting of the Royal Horticultural Society these plants were the subject of three papers, prepared by Mr. F. W. Burbidge, Mr. Allen and Mr. Melville respectively. Mr. Burbidge's paper was historical and botanical, the other two dealing chiefly with the horticultural aspects of the genus. Of course, the accepted botany of the Snowdrop, as indeed of all Amaryllidaceous genera, is that of Mr. Baker, of Kew, who describes six species of Galanthus in his book, viz.: *G. nivalis*, *G. Græcus*, *G. Elwesii*, *G. latifolius*, *G. Olgæ* and *G. plicatus*. To those must be added the newly described *G. Fosteri* and *G. Alleni*. The commonest, and, taken altogether, the best of all these, is *G. nivalis*, which is wild in the meadows and copses of England, and may be established almost anywhere. It varies somewhat in the size, form and marking of its flowers, a considerable number of varieties having distinctive names, such as reflexus, lutescens, poculiformis, octobrensis, Imperati, Redouté, etc. I confess to being somewhat blind to the distinctive characters of many of these varieties. Plant them all side by side, and they present no difference to the ordinary eye.

Fig. 31.—Lælia anceps, var. holochila, Rolfe.—See page 172.

Mr. Allen, who is the first authority on garden Snowdrops, considers *G. plicatus maximus* the best of all. The type is a native of the Crimea, whence it was introduced into England at the time of the Crimean war. The variety originated, I believe, in Mr. Allen's garden. It flowers later than the common Snowdrop, and has larger flowers. Of *G. Elwesii*, Mr. Allen has not so good an opinion as other growers have. It certainly is a bad species to cultivate, dying out if planted in ordinary beds, or deteriorating so much as to be inferior in size to the common kind. At its best it is a handsome Snowdrop, the flowers being large, globose, and of the purest white. *G. latifolius* has larger leaves and smaller flowers than *G. nivalis*. The new *G. Fosteri* has disappointed many who had been led to believe that it was larger in flower, more elegant in form, and in other respects superior to all other Snowdrops. At Kew it has not even equaled some of the forms of *G. nivalis*. Its fragrance was scarcely perceptible. Possibly it may improve after it has become established, though, as a rule, Snowdrops are better the first year after importation than afterward. *G. Fosteri* is named in compliment to the eminent English physiologist, Dr. Michael Foster, who introduced this species from central Asia Minor. *G. Alleni* has been described as "the finest of all Snowdrops." Mr. Allen says it is "nearer to *G. latifolius* than to *G. Caucasicus*, but the foliage is different in color, and the whole plant is much larger. It grows very robustly and flowers very freely. It is one of the most distinct Snowdrops I have, and my friends to whom I have sent roots speak very highly of it." Mr. Allen interests himself in the crossing of the different species of Galanthus with each other, and although, as I have already said, we have nothing better than the true "Flower of our Lady," the common *G. nivalis*, better may yet be obtained. It is stated that Herr Max Leichtlin knows of a pink Snowdrop in Armenia which he will no doubt obtain, if any one can. Let us hope that it is a better pink color than the so-called yellow Snowdrop is a yellow. Rumor has it that in a certain cottage garden in England there is "a colony of Snowdrops with bright yellow flowers!" Possibly these wonders belong to the same category as the Blue Chrysanthemum and Crimson Daffodil.

Mr. Melville's paper was full of practical hints, and the photograph exhibited by him of a wood carpeted with Snowdrops at Dunrobin Castle showed how effective these plants are when planted in grass under trees. It is not every garden that suits Snowdrops, but where the soil proves suitable they ought to be planted under trees on lawns, and in all such places as would be beautiful if studded with the pretty flowers of the first herald of spring. By the way, I may note that, instead of February, March has been the Snowdrop's month in England this year.

Max Leichtlin on Hardy Plants.—The renowned horticulturist of Baden-Baden does not often express himself at any length on the cultivation of plants. The announcement of a paper by him, to be read at the last meeting of the Royal Horticultural Society, was therefore sufficient to attract many of those who take a special interest in that class of plants with which Herr Max Leichtlin has always been prominently identified, namely, hardy herbaceous and alpine plants. The paper consisted of concise practical observations on the behavior and peculiar requirements under cultivation of hardy bulbs, plants, primulas, and the choicer alpines. The writer recorded his own experiences and views derived from them. Of course he would admit that many cultivators of hardy plants meet with success by following other methods, often very different methods too, from those which prove suitable at Baden-Baden. There are fifty roads to town, and often as many to success in the cultivation of any given plant. Any one who reads the cultural directions of trustworthy practitioners will have noted this fact.

Max Leichtlin begins by stating that to imitate the natural conditions in the growth of hardy plants is the first step to success. To this the obvious reply is, that it all depends on what the natural conditions are, and the cultivator's resources. He does not believe in the possibility of acclimatization for plants, although many people still have faith in it. That many plants prove hardier when under cultivation than they appear to be in a state of nature only proves their elasticity. An example of how easily one may be deceived by the behavior of plants was seen here lately, in the effects of frost on some seedlings of *Clematis Stanleyi*. The seeds had all been obtained from south Africa. About fifty of the seedlings were planted, last summer, on a south border at Kew, where they grew well and flowered, nothwithstanding the unfavorable weather here last summer. The first severe frost killed the leaves of all the plants except three, which remained uninjured; nor were these three hurt by the cold which killed

all the others down to the ground. It is easy to see how the behavior of the three hardier seedlings might have been misinterpreted under treatment of a different kind from that which they received.

Max Leichtlin mentioned *Calandrina umbellata*, a native of Chili, which never experiences frost in nature but bears at least seven degrees at Baden-Baden. *Zephyranthes candida* is still more remarkable, for, while it is found wild only in the low, moist plains of the La Plata, the other species of Zephyranthes being always on the hills, under cultivation in England it is as hardy as a Snowdrop, and is the only one that can be grown out-of-doors.

On the question of seed-sowing, Max Leichtlin made the following suggestions: The seeds of all hardy plants germinate more quickly and give better results if sown as soon as they are ripe. It is, of course, often convenient, and even necessary, to keep many seeds until the spring before sowing. Hard-shelled seeds, he said, must be sown at once. I confess I do not see the necessity for this. As a rule, seeds with a hard shell are easily kept; they lose nothing by being kept, and they germinate freely if soaked in hot water before being sown. Seeds with oily albumen are, of course, an exception to this rule. Immediate sowing is also recommended for seeds of all bulbous plants as soon as ripe. Delay in the case of seeds of Lilies, Fritillarias, Tulips and others means the loss of about eighty per cent. of the seeds. The same rule holds good in the case of Campanulas, or the seeds will lie dormant a whole year. All bulb seeds, except those of Gladioli, should be buried an inch deep, says Herr Leichtlin.

The seeds of Himalayan Primulas take three weeks to germinate unless exposed to a shower of rain after they have been sown a few days, when they will germinate in twenty-four hours. Others entirely lose the power to germinate if allowed to get dry. I have found tropical treatment, such as one gives to the seeds of Gloxinias, expedite the germination of such seeds as *Primula imperialis, P. Poissoni, P. prolifera, Ranunculus Lyallii* and other sluggish hardy alpines.

It is surprising how soon a high temperature with moisture induces germination in such seeds. *Victoria regia*, which, sown in a temperature of eighty-five degrees, takes a month to push through the hard shell, may be made to germinate in about three days if sown in water at a temperature of 160 degrees Fahrenheit. The seeds must be removed to a lower temperature as soon as the plumule appears.

Max Leichtlin believes much in the influence of frost on the vegetation of seeds. Even those of such plants as Kniphofia and Tecophylœa germinate more freely by exposure to frost for a time after sowing. Soft, pulpy seeds, unless quite hardy, should not be treated in this way. All bulbous seedlings should be left in the seed-pan at least a year.

Turning to the plants, he said all those with hairy or spiny leaves require a dry sunny position. Nearly all Primulas are happiest when planted in cool, shady spots. Hellebores thrive best if exposed to full sun in winter, full shade in summer. Manure was spoken of as the curse of the alpine-garden. According to Max Leichtlin, no rock-plant should have manure, which may be true at Baden-Baden, but the reverse at Kew, as well as in many other gardens. Nor do we find that most bulbs grow equally well in light or heavy soils. Of course the terms light and heavy are vague, but there are very many hardy bulbous plants as well as tender the behavior of which in light sandy loam is much less satisfactory here than in rich buttery loam. Max Leichtlin advises that no manure should be given to newly imported bulbs. I presume he meant only those bulbs which have suffered much through exposure and drought, as this cannot apply for Lilies, Tulips, Hippeastrums, Narcissi and many other bulbs which are largely imported annually. Most of his herbaceous borders, he stated, have had no manure for ten years. This says much for the excellent quality of the soil in his borders. All sick bulbs are recommended to be lifted, washed and thoroughly cleaned, and replanted in virgin soil. *Lilium candidum* is invariably ruined if dosed with manure. Fritillarias are naturally lime-loving plants, but at Baden-Baden they thrive in a soil quite free from lime. The American and Himalayan species like a somewhat shaded position.

The plants which received special notice at the meeting were the following: *Saxifraga Boydii*, a hybrid between *S. aretioides* and *S. Burseriana*, raised by Boyd, of Kelso. The latter parent is one of the most beautiful of all cultivated Saxifragas, both as a pot plant and on the rockery. *S. Boydii* is exactly like it, except in the color of its flowers, which are soft primrose-yellow.

Chionodoxa grandiflora.—This is merely a variety of *C. Luciliæ* with fewer flowered racemes, and flowers a little larger than in the ordinary forms of the type. It was previously called *C. gigantea*. There is a tendency among dealers to overname these little hardy plants, Chionodoxas having suffered a good deal from too much attention of this kind.

Azalea mollis, vars. *Mecene* and *Norma*.—These are semi-double varieties, good in habit, free-flowering, and the flowers decidedly pretty. Mecene promises to be a really useful plant for early forcing, as the flowers are white, with the faintest tinge of yellow on the outer segments, and they would meet with favor on account of their elegance and substance. Norma is of similar character, but the flowers are orange-red.

Other exhibits which received awards were Camellia Beauty of Waltham, a perfect double flower with blush-white petals; *Arum Palestinum*, an old garden plant which is hardy in some parts of England. It has a large black purple spathe and spadix, and grows to about eighteen inches in height. This plant is frequently sent to Kew by tourists in the Holy Land, who imagine that they have discovered something new. It was offered a year or two ago under the alluring name of *A. sanctum*.

London. *W. Watson.*

Cultural Department.

Calatheas.

UNDER this head are included some of the best foliage plants for warm-house culture, as well as some that will succeed in moderate temperature. They are a moisture-loving group, and are doubtless found in the condition of undergrowth in tropical forests, the majority being natives of either Central or South America.

The few species referred to here are all well worth cultivation in the most select collection, and possibly may be more readily recognized by some readers as Marantas, since most of them were originally sent out under that name. Many of the Calatheas, or Marantas, prefer warm treatment, in order to develop their beautifully marked leaves to perfection, and during the summer they also require shading, as the foliage of most of them is quite tender. In the matter of soil, a rough open mixture is preferable, and in potting it is best not to press it down too firmly, else the roots do not easily penetrate it. The drainage of the pots should also be looked after with care.

By the term "warm treatment" is meant a temperature of sixty-five to seventy degrees at night, with plenty of moisture both in the atmosphere and at the roots of the plants, and while such treatment will be congenial to many of the Calatheas, yet there are some that can be successfully grown under very different conditions. The propagation of these plants is effected by division, and about this season of the year is a good time for this operation, though it may be performed at almost any season, if done with care. Spring or early summer is also the most satisfactory time for repotting the plants, even though the increase of stock is not desired.

C. Veitchii, a plant of strong growth and very beautiful foliage, is one of the best of the genus. It attains a height of three feet or more, the leaves being ovate in form and standing almost upright, while in color they are dark, glossy green, with several crescent-shaped blotches of yellow on each side of the midrib, which are toned down by various shades of green and white. The under side of the leaf is light purple, and this adds to the rich effect of the whole.

Another charming species is *C. Makoyana*, which is also beautifully marked, though quite dwarf in habit. The leaves of this plant are thrown up on slender foot-stalks to a height of about one foot, and are oblong, with somewhat unequal sides. The outer margin of the leaf is dark green, and the centre semi-transparent and marked with yellowish white, in which the veins show quite prominently. When well grown this is a remarkably pretty plant, and is well suited for collections where space is an object.

C. fasciata is also a good species, and of free growth. It produces broadly ovate leaves nearly one foot in length and about eight inches wide. They are bright green, with broad bands of white reaching from midrib to margin, and the under side is pale green, flushed with purple.

C. illustris, another distinct species, has ovate leaves of bright green color, marked with bands of deeper green, and also with two irregular bands of white, running from the base to near the apex. The foliage of this species is also quite large, and it is of free growth in a warm house.

C. roseo-picta is one of the most attractive small-growing kinds, with glossy dark green leaves that are nearly round. The midrib is rose color, and two bands of the same color traverse the leaves almost from end to end.

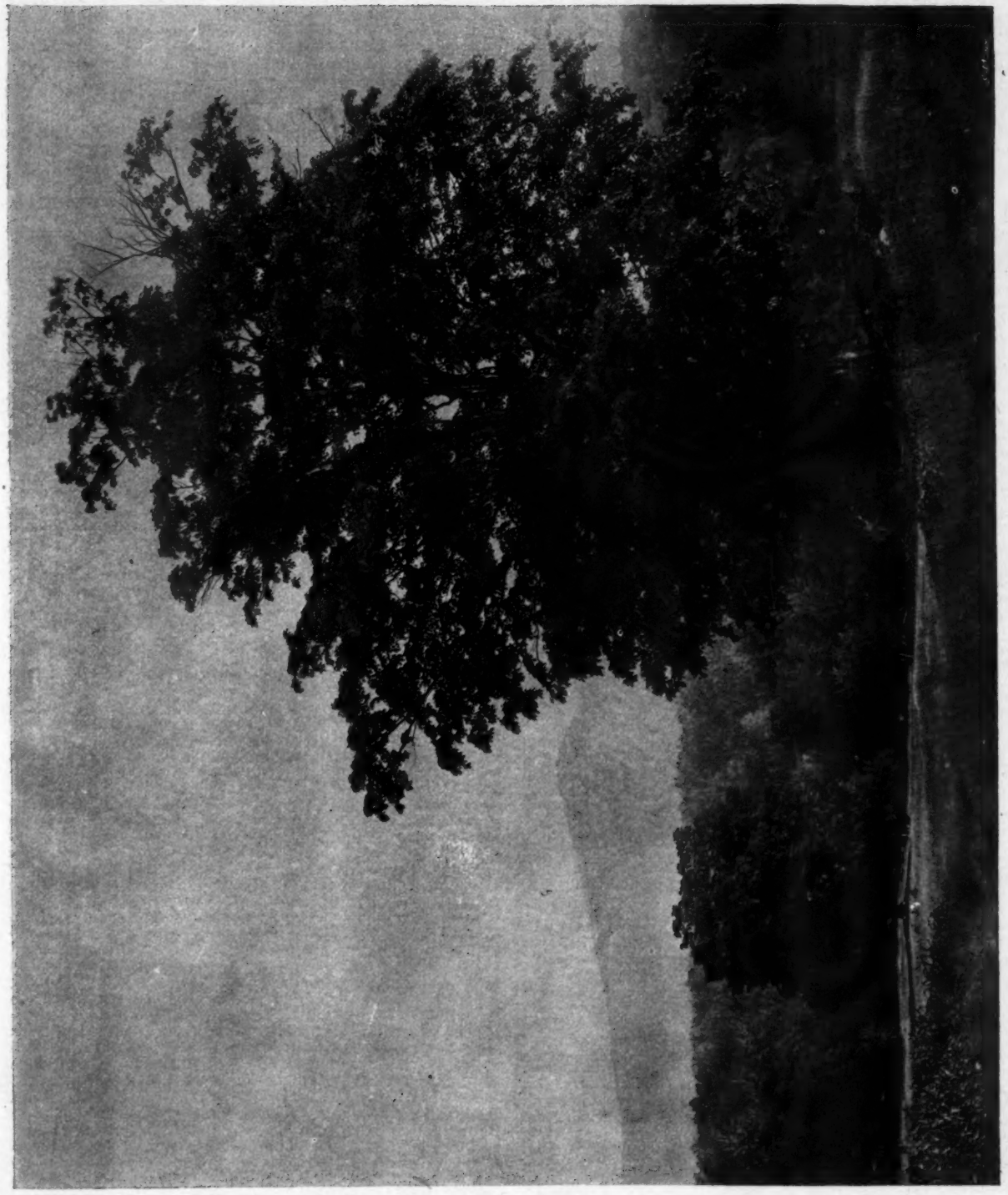

Fig. 31.—Sugar Maples in New Hampshire.—See page 170.

C. tubispatha is more rarely seen. Its leaves are of medium size, pale green, and ornamented with a row of chocolate brown blotches on each side of the midrib. This species is nearly or quite deciduous, but should be taken care of during the winter, in order to keep the tubers in good condition.

One of the best known of this genus is *C. zebrina*, and a very useful one it is too, for it will bear more hardship than any other member of the family—not only making a satisfactory house-plant, but also being useful for out-door work in summer.

C. Vanden Heckei is another easy one to manage, and has erect leaves of dark green, shaded with lighter color, the midrib being margined with white, and two bands of the same are found between the midrib and margin.

Holmesburg, Pa. *W. H. Taplin.*

The Wild Garden.

I HAVE in mind a piece of ground about three feet square which contains fourteen varieties of transplanted wild flowers. They are interesting to watch from the uncurling of the first Fern-frond in April till the Arum drops its scarlet berries in October. In most yards there is a shady corner in which wild plants might be set. The soil need not be stirred, or enriched or changed for leaf-mold. If once or twice in the summer the grass-roots are pulled out it is about all the attention required. Wild flowers are used to "short commons" and to exerting themselves to hold their own. Nature does not see fit to pet or coax them, as so many other plants are always pushing and crowding for a foot-hold. So these wildings get a certain hardy, wiry toughness, though it seems as if the winds must be somewhat tempered to the delicate Spring Beauty. This has a small tuber buried as deep as the height of its stem above ground. It is frail, but bears careful transplanting. The Hepatica or Liverwort, which has hardy leaves, may be found and moved at any time when the ground is not frozen. As early as January the mass of gray downy buds at its heart may be seen. The blossoms have quite a range of color, something unusual in a wild flower. The bright blue is perhaps prettiest, especially when wide open, in the sun, but the pink and lilac ones are of so pure and fresh a tint as never to seem faded. The Bloodroot grows best in rich garden-soil, its leaves and blossoms becoming large and showy. In lifting the plant it should be remembered that its root-stock is at right angles to the leaf-stem. It blooms before the leaves are fully developed. The seeds, of pin-head size, are abundant, and it would be an interesting experiment to plant them.

Of the twenty-two varieties of native Violets only two have been tested in the garden. The Arrow-leaved, found by a dry, hilly roadside, lived only through the summer. The Bird's-foot Violet grows in a fringy clump, as the dark leaves are finely divided even to the stem. The blossoms, in cultivation often over twenty in number, are light blue, shaded to white at the centre, and it is altogether a superior plant. My first sight of it was in a Pine-woods, which it seemed to light up as a line of poetry might a chapter of prose. I have seen it once since growing on a rocky hill-top, from which I dug it and carried it wrapped in wet Oak-leaves a number of miles to my garden, where I introduced it to the Maiden-hair Fern and other select society.

Arisæma triphyllum, or "Jack-in-the-Pulpit," grows amazingly in rich soil, but is really prettier when small. It has a corm or solid bulb, with an extremely acrid taste, and said to be poisonous. This Jack has his time of peering solemnly from under his leafy sounding-board, and then, his message delivered, there goes on all summer a transformation by which he becomes a bunch of shining, scarlet berries. The small, imperfect ones, which ripen in the woods, give no hint of the beauty of a fully developed specimen. One which grew in the garden last year ripened in September, and lasted for a month. It was fourteen inches high, and had sixty berries, each of which contained from one to five large, white seeds, and a few drops of orange-colored juice. The dull crimson receptacle, seen by removing the berries, was covered with depressed scars where the berries joined. Its interior, like the stem, was filled with white, webby pith.

I shall never forget coming upon a great circle of cardinal flowers in full bloom in a moist sunny glade. I gathered a handful, and, showing them to the one on whose farm they grew, I for the first time heard them called "Nosebleed," a name more true than beautiful, and was told of their use in dyeing. By setting a vase of them in a plate of water one may notice particles falling and dissolving a brilliant coloring matter.

Several roots from a river-bank were set in rich garden-soil, which was prepared by wetting, for a foot or more in depth, to the consistency of thick mud. Planted in August, they were well established before winter, and the next year grew on through six rainless weeks with no watering at all. By August the tall blossom-stem showed the brightest color in all the garden. Its top nodded, but it need not have been so modest. But some rushes, accidentally taken up with it, did look out of place standing stiffly by a graceful Columbine. The purplish blossoms of the Wild Bean, *Phaseolus perennis*, are due in August, as are the wild Crimson Pinks. All these, with a Cranberry-vine and varieties of ferns, complete the company of fourteen which live in one little wild garden.

Hartford, Conn. *Amy Wightman.*

The Spring Garden.

SHARP frosts still continue every night to bind the surface of the garden, and, despite the daily advancing sun, there is still much chilliness in the air. Under these conditions the spring garden makes very slow advances. However, one can note, from day to day, continued progress among the hardy plants, and bulbous ones especially are the least influenced by adverse conditions of temperature.

Iris reticulata major—blooming in March—is a noticeable addition to the early-flowering bulbous varieties, and perfectly hardy. The flowers are larger than those of the type, and of a rich deep royal purple, with a spot of yellow on the falls. The falls do not droop as much as the typical *I. reticulata*, thus increasing its apparent size. The flowers of these dwarf Irises are quite persistent, this variety lasting in good form for ten days. *Iris Bakeriana* blooms were in good condition eight days when they disapp eared under the snow. In the mean time they had passed through a night when the temperature had dropped to zero without apparent harm. Aside from the beauty of the early spring flowers, there is an unfailing interest in watching, year by year, their development under the various adverse conditions, and one acquires a friendship for them which is stronger and more personal than the regard for those of other seasons. Of quite a different form of beauty is *Iris Persica*, the first flowers of which are just expanded. This is an old variety, not grown as generally as it should be. It is a bulbous variety, placed in the Juno section, and the flowers, white, with purple and yellow markings, appear before the leaves, and are apparently stemless. It seems to be hardy in not too wet locations, and, like most hardy bulbous plants, should be planted early, so as to form roots before winter. Of course the flower-buds are formed in bulbs before they go to rest, and even late-planted bulbs will flower well, but precautions should be used in planting out, and especial care will be necessary if they are grown in pots in a cold frame from which frost is not entirely excluded.

Some of my surprises last winter were losses of *Iris juncea* and *Homeria collina* in pots, while plants of the same are alive in the open. *Ornithogalum Arabicum* potted up was destroyed, while those planted out under the same sash are alive and vigorous. It would seem that in pots, with their rigid sides, frost, for some reason, takes a stronger hold, and is apt to disentegrate bulbs, which, in freer soil, would escape ruin. This fact is probably familiar to professionals, though I have never happened to see it in print, which leads me to say that these small points which every one is supposed to know are exactly the things which interest the amateur gardener and save him from losses and disappointment. Our professional friends, who are kind enough to impart to us a great deal of instruction in their catalogues and the horticultural press, do not seem to realize how little we amateurs know about cultural matters, and how helpful it is to have the simplest hints. But to return to the garden. *Anemone blanda alba*, from Herr Leichtlin, seems a different form of flower from those of the type from Asia Minor, the petals being fewer and blunter. The white is of a more creamy tint than in white forms of the latter variety. One cannot have too much of either, as a bed of these on a sunny day in February and March produces an effect which cannot be secured from any other flowers at that season.

Chionodoxa gigantea or *grandiflorum*, as it is now named, retains its character as a distinct variety. Established plants throw flowers larger than *C. Luciliæ*, and of a more slaty blue, and without the distinct white eye of that variety. A crop of Chrysanthemums were grown over my bed of small bulbs last season, and the condition of the Chionodoxes this spring is a practical example of the folly of expecting to double-crop such a bed without injury to the bulbs.

One always welcomes the Narcissi as the first of the really conspicuous spring flowers, and the first satisfactory for cutting. Trumpet Major is open on the border, and a collection in a warm corner is in all conditions from bloom to apparent dormancy, thus promising a long season. So far the flowers

have appeared in the following order: Scoticus, Henry Irving, Countess of Annesley, Ard Righ, Trumpet Minor, Obvallaris (Tenby).

My collection of Narcissi is so small that I cannot consider myself anything of a specialist in these flowers, in these days of collections with varieties numbered among the hundreds, but I may be allowed to remark that, for ordinary garden purposes, one could select a dozen varieties of Daffodils which would satisfy the wants of the average cultivator, and the cheapest are by no means the poorest. Fortunately, the rage for these bulbs has brought them largely into cultivation, and it is rapidly becoming possible to secure choice varieties at prices within reach of every one. With Daffodils about as cheap as Onions, there does not seem much excuse for not planting them in every spare corner.

Elizabeth, N. J. *J. N. Gerard.*

Lælia anceps Sanderiana.—Of the numerous white varieties of *Lælia anceps* which bloom during December and January, perhaps none is so popular as this. It has only been in cultivation about six years, and, although it comes near the beautiful variety Dawsoni, still it has the advantage over this in being much more common. The flowers are very large, and seem to improve, in size, substance and covering every year, with good cultivation. The sepals and petals are pure white, the latter being very broad in comparison, while the lip has a large white front-lobe, with a deep crimson-purple blotch on it in front of the yellow, ridge-like callus which runs from the base, and on each side of which are radiating, broken lines and spots of rich purple, which give the flower a most charming appearance. It is not uncommon to see from five to seven flowers on one spike, and when several spikes are borne on good plants, one may expect to have a display of beauty for several weeks. After the flowers are cut they will remain almost perfect for about a fortnight.

London. *J. Weathers.*

The Hydrangea Blight.—For about a year and a half the cultivated Hydrangeas, and particularly those growing under glass in the winter, have been troubled with large, rusty-brown blotches upon the leaves. So serious is this blight in some greenhouses that the tops of the plants have been entirely cut away, but even this heroic treatment failed, for the vigorous young growth afterward became as badly blighted as before. In many cases the disease has caused serious losses to those who have been growing Hydrangeas for Easter decoration. This blight is due to Fungus only recently described, and it is known as *Phyllosticta Hydrangeæ*, E. & E. The pest is spread by means of innumerable spores, which are borne in minute pimples that beset the brown areas of the leaf. As it is closely related to the black-rot of the grape, it may perhaps be controlled by the standard fungicide now used on diseased Vines, namely: carbonate of copper dissolved in ammonia water. This note is to suggest a trial of this remedy by those whose Hydrangeas are affected.

Rutgers College. *Byron D. Halsted.*

The Forest.

Prairie Forestry and the Timber Culture Law.—II.

THE requisites of successful tree Culture on the Dakota prairies are: 1, deep-plowed land, thoroughly fined before planting is begun; 2, the use of trees or seeds that are in good condition when planted, and that are set firm, with the roots in moist earth; 3, thorough culture, so that at least until midsummer a crust is not permitted to form on the surface of the soil; 4, perfect maturing of the wood, secured by cessation of culture at midsummer; 5, freedom from grass and perennial weeds. To meet the requisites prompt and careful attention is demanded at a time when the active work of the farm is most pressing. When it is remembered that most of the settlers in our state were poor, and depended on their crops for a living, it will not be wondered at that the one crop which brought no money return, the trees, was most apt to be neglected. When we recall the exacting demands of successful tree-growth, the wonder is not that so many failed, but that any succeeded.

It is not strange that ten years ago, when South Dakota began to secure its great influx of settlers, the people failed to comprehend at once the new climate. They planted as they had done in their former homes. That greater culture was necessary, in order to supplement a decreased rain-fall, was only learned at the expense of many failures, not of trees only, but of all other crops as well. It is unjust to say that the failure of artificial groves in this state was due to universal fraud; it was the result in great measure of honest ignorance. In justice to thousands of worthy citizens, who in the early days of their Dakota residence failed to understand the new conditions by which they were surrounded, the present Timber Culture Act should not be repealed, but should be amended so as to enable them, profiting by the knowledge which nothing but experience could give, to fill out their plantations and by better culture insure the growth of the requisite number of trees per acre.

Additional time will enable thousands of holders of timber claims to satisfy both the spirit and the letter of the law, who without it must relinquish their holdings, and thus lose whatever improvements they have made on the land.

The law itself contains a great element of weakness. Instead of compelling the entryman to begin planting two years after his entry is made, at least twice that time, with the methods of cultivation in vogue in this country, is necessary to properly prepare the soil for trees. By our common practice two years is not sufficient to kill the native vegetation of the western prairies. Extraordinary culture must be given if the planter would have his land ready to receive trees within the time required by law. If trees are planted in land filled with the roots and underground stems of strong prairie grasses no amount of after-culture will enable the planter to secure the growth that moderate cultivation would have insured had the soil been properly prepared before the trees were set. Thousands of tree plantations that will never enable their owners to secure a patent on their land are evidences of honest, though not the most intelligent, effort; and it is right that Government should favor such planters, and enable them to secure titles to their land in some such way as the Dunnell Bill provides, if the present law must be repealed. Every grove in South Dakota, western Iowa, Nebraska and Kansas is the outcome of the one effort of Government to encourage tree-culture. If the law has failed to meet the expectations of its promoters, it has filled for thinking men a higher purpose—it has shown that Government action can aid in checking winds from drying out the plains if it will but use its abundant means and power.

Every year vast sums are appropriated by Congress for the improvement of streams; public money is spent for the improvement of water-powers for manufacturing towns; for erecting magnificent public buildings; for sending Congressional committees to the uttermost parts of the land; and why should not the parched prairies receive a part of this vast largess?

Our representatives in Congress continue to permit, through lack of simple legislation, the wholesale spoliation of the forests of the country. The head-waters of our great rivers are rapidly being robbed of the shade that sustains them. If Congress spends money on our water-ways, why not begin at the fountain-head and reclothe the bare mountain-sides with forests?

Every year adds to the apparent necessity for overcoming the aridity of the western plains. Congress, by its appointment of committees of inquiry and investigation, is beginning to recognize the importance of the subject. Irrigation will do much toward supplying the needed moisture, but the more carefully one studies the conditions the more convincing becomes the belief that not until an adequate forest-growth is maintained on the mountain-sides and where it is possible on the level stretches between them and the great rivers, will this growing problem be satisfactorily solved.

Agricultural College, Brookings, S. D. *Charles A. Keffer.*

[Since the above was written the Timber Culture Act has been repealed, but the argument of Professor Keffer is worth preserving as it stands.—Ed.]

Correspondence.

Sap-sucking Woodpeckers and Forest-trees.

To the Editor of Garden and Forest:

Sir,—In answer to your request, I am happy to state briefly the results of certain investigations made by me into the effects upon forest-trees of the attacks of Sap-sucking Woodpeckers (*Sphyropicus varius*). In an extended article which is to appear in the next number of the *Auk* I describe, from the ornithologist's standpoint, the birds' method of attack and the way in which they use the sap which they drain from various forest-trees. My observations were made near Mount Chocorua, New Hampshire, partly in July and August, 1890, and partly in the two preceding years. The region is covered mainly by conifers, Poplars, Maples, Birches, Oaks and White Ash.

The trees selected by the birds which I watched were Red Maples, Canoe Birches and Red Oaks. In other localities they attack the Mountain Ash, the Black Alder and some other trees and shrubs. The trees chosen are comparatively young, strong, and well exposed to the sun. Beginning about twenty feet from the ground, on a tree of twice that height, the birds drill a ring of small angular holes in the bark to, and, probably in the majority of instances, through the cambium layer. The holes are so cut as to catch and hold small quantities of the descending elaborated sap. In order to maintain a steady flow of sap the birds drill several new holes each day. They also widen such of the old holes as continue moist, sometimes merging two or more holes into one. New holes, after the tree has once been encircled, are always placed above old ones. It seemed to me that some of the holes yielded much more sap than others, and that the birds observed this and placed the next new holes immediately above these prolific ones. The old holes become dry in time, and the bark cracks near them, thus making the girdling of the tree complete. This is especially true of the Canoe Birch.

A Red Maple, which I watched for many days, contained over 800 punctures. In August last it was yielding sap so freely that a steady current streamed down the trunk to the ground, while from the best holes bubbles were blown by the sap as it flowed from the bark. This tree was evidently dying. Some of its limbs were dead. Its foliage was scanty, and the leaves drooped in the sunlight. Its sap in July was as sweet as well-sugared water.

In a hundred acres of woodland which I searched with care for the traces of this bird's operations, I found four families at work in as many separate spots. They were working all day and for weeks in succession. The trees which bore their marks were newly drilled, dying, dead or long dead, and decaying. In ten years these four families had killed eighty trees —perhaps more, probably fewer. Lightning and snow combined do far more damage than these birds. As a timber-owner, I should not think of shooting these birds for any injury done by them to my forest-trees. With fruit-trees in my neighborhood they meddle little, but it is perhaps because the orchards are old and unattractive.

Summary.—The Yellow-bellied or Sap-sucking Woodpecker is the most numerous of the *Picidæ* in the White Mountain region. It attacks chiefly the Canoe Birch and Red Maple, and during a considerable part of the summer works throughout every day, draining them of sap. The birds work in family groups and use only three or four trees at a time. They return to these from year to year until the trees die, when others near by are attacked in turn. The amount of damage done by the birds is insufficient to justify killing them, at least so long as their numbers remain no greater than at present.

Cambridge, Mass. *Frank Bolles.*

Recent Publications.

Third Biennial Report of the California State Board of Forestry, for the years 1889-90. Sacramento, 1890.

An account of the true Pines of California appeared in the Second Report of the Board of Forestry of that state from the pen of the botanist of the board, Mr. J. G. Lemmon, who now supplements this with a paper on the other coniferous trees of the Pacific forest, which occupies the larger part of this third report, and which is enriched with many admirable illustrations made from photographs of trees, forest-scenes, and fruiting branches of many of the species. In this paper, after some remarks upon conifers in general, their history and distribution, Mr. Lemmon describes their classification, and then proceeds to give an account of the different species (exclusive of the Pines) found in California, and in the regions of which California must be considered, from the botanical point of view, an integral part, that is, all the great territory of western America which extends north and west of the state. An account of the different species is preceded by notes on the genera to which they belong, and to this is added some information relating to species which occur entirely beyond the region. In the case of the Hemlock, for example, there is a short account of our eastern species, and of the Asiatic species of this genus; and under the Spruces, not only are the Pacific coast species described, but the White and Black Spruces of the east as well, the European Spruce, and some of the Japanese species. Changes in the generic and specific rank of a few trees are proposed. The Alpine Hemlock is here removed from Tsuga and made to compose the genus Hesperopeuce (Engelmann's sectional name), a genus characterized by Mr. Lemmon by its alpine habitat, its cones, which are longer than those of any Hemlock Spruce, oblong-cylindrical, and two to three inches long, with numerous scales, nearly all of the same size, and reflexed at maturity, broader than long, four to eight lines wide, and striate with a thin, wavy, rounded border; by the small, spathulate bracts three to four lines long, by the angular seeds with resin vescicles, and elliptical wings, three to six lines long, and linear scattered quadrangular leaves keeled above and below with a solitary and large resin duct. "The propriety," he says, in speaking of this tree, "if not the scientific necessity, of separating it from Tsuga may be justified upon the ground that the conifer family is so large, and the necessity for dividing it into groups for convenience of comparison is so apparent, that comparatively slight differences—so they are fundamental—must be taken for generic distinctions"—a view of genera, in which, we fancy, all students of conifers will hardly concur.

The large-cone Douglas Fir of the mountains of southern California, which Engelmann considered a variety of the widely distributed *Pseudotsuga taxifolia* is now restored to specific rank under the name of *Pseudotsuga macrocarpa*, because the author recognizes "in it elements that certainly point to such separation. It must be borne in mind," he remarks, "that the evidence of distinctness does not depend so much upon the number of characters as upon their permanence. Now the characters of this Spruce are always uniform—no transition trees connect it to the other species. Again, the other species is both north and south of it, particularly north. If this big-cone development is a recent variation, what has produced it? If a southern climate, why are not the Arizona and Mexican trees still larger coned? If a dwarf variety, why so prolific in fruit?" Mr. Lemmon, in a note, calls attention to the fact that when he visited the headquarters of this tree, in the San Bernardino Mountains, in 1876, "the cones of the preceding year's crop lay on the ground so abundantly that they were two or three feet deep under the trees—a degree of fecundity never observed in the Taxifolia species."

The Red Fir of the Sierras, *Abies magnifica*, is well described, and the variety of northern California, which so long puzzled botanists by its long, exserted cone-bracts, resembling those of *Abies nobilis* of Oregon, is described as the variety *Shastensis*. "The peculiarity of this variety of Fir, aside from its locality, is connected entirely with the fact of its cone-bracts becoming long and protruded, a half to a full inch between the scales, rendering the large purple cones, thus decked out with tasseled fringes, a most beautiful object." The trees of this variety, Mr. Lemmon tells us, are "very large and lofty, though not so immense and high-headed as in the typical southern form, but they become, on the southern slopes of Shasta, a dark, gloomy assemblage of massive black trunks, colored, on the north side, from base to the limbs, with bright yellow lichens or tree-moss, the lower limbs draped, here and there, with long sweeping festoons of black filmy lichen, giving a funereal aspect to the whole scene, scarce relieved by the twitter of a red squirrel, the long wailing note of a woodpecker, or the occasional cry of a bald eagle." A second variety of this species is distinguished as variety *xanthocarpa*, "a smaller, less symmetrical tree than the typical, with smaller cones averaging four to five inches long, half as thick near the base, tapering slightly to the apex, and of a yellowish color." It is found in the high Sierras around Meadow Lake, Sierra County, where, Mr. Lemmon tells us, it forms the greater part of the noble forest of that region.

Mr. Lemmon considers the White Fir of the Sierras and of the mountains of southern Oregon simply a somewhat modified form of *Abies grandis* of the north-west coast, "distinguished by having a rather rigid habit, the branches relatively shorter and stouter than those of *Abies grandis*. The young shoots are olive-green, the buds ovoid, the leaves dark green above, whitened with stomata below (also with a few rows above), the leaves relatively very long—one and a half to two inches—nearly all of the same length, obtuse at the apex, not usually two-ranked except on lower branches, yet all are twisted half around at the base, which allows the light to reach through to the branchlets past the distorted leaves. It is, in fact, midway both in locality and in characters between the green-leaved and green cylindrical-coned *grandis* of the moist northern forests and the white-leaved and light green elliptical-coned *concolor* of the southern arid interior regions." It is this tree which is called *Abies Lowiana* in English plantations, and which, from a horticultural point of view, is very distinct from the species of the north-west coast, although hardly distinguishable from the long-leaved form of the Rocky Mountains.

It is not quite clear whether our author intends to consider the California Sierra tree one variety and the Colorado tree a

second variety or not. He adopts for the California tree the name of *Abies grandis*, var. *Lowiana*. If he considers it distinct from the *Abies concolor* of Colorado, his seems to be the correct name, but if he holds that there is really but one mountain form of *A. grandis* worthy of a distinct name, then this should be known as variety *concolor*, it having been named *Abies concolor* before the name of *Abies Lowiana* was bestowed upon it.

Mr. Lemmon, in his very full and interesting description of the Big Trees, raises an interesting point as to the origin of the name Sequoia. The name was made by the Austrian botanist, Endlicher, who published the genus in 1847, but, unfortunately, did not give the etymology of his name. It has been generally supposed that it was formed from the name of the half-breed Cherokee Indian, Sequoyah, a man distinguished in having invented a syllabic alphabet for his tribe. Gordon, however, in the second edition of his "Pinetum," published in 1875, states that the name was probably formed from "sequence, separated or following in order of succession after Taxodium from which Professor Endlicher separated it." Mr. Lemmon now says that Professor Gray, at the time of his visit to the Pacific coast in 1877, informed him that "the report of its being derived from Sequoyah, the Cherokee, was doubtless an afterthought; that undoubtedly Endlicher derived his name from sequi or sequor, alluding to the well-known fact that our Redwoods are the followers or remnants of several colossal extinct species."

Further investigations do not throw much additional light on this subject, and the answers sent in reply to Mr. Lemmon's inquiries by a number of distinguished men are not very satisfactory in their conclusions. The venerable De Candolle writes: "The supposed origin of Sequoia from Sequoyah or Sequamal is entirely fanciful. By the appearance of the name it is probable that it originated from or was taken up from some native word and written more or less correctly. Historically, it is a matter of regret, of course, that any doubt rests upon the origin of the name of the two trees which surpass all others in size and in the interest attached to the history of the genus to which they belong. But, after all, as De Candolle writes, "it matters little, a name is a name, the essential things are, first, that it be the expression of a natural genus; second, that it has not been employed before; and third, that the genus has not previously received another name."

Mr. Lemmon's paper contains, in convenient and acceptable form, a great amount of useful and interesting information, botanical, historical and economic, relating to the trees which compose the larger part of the Pacific-coast forests, and which make these forests the most wonderful and important forests of conifers known to man. It will be welcomed by all serious students of American trees, and will take its place in the permanent literature of the subject.

Exhibitions.

The New York Spring Flower Show.

THE first exhibition of the New York Florists' Club, held in the Lenox Lyceum last week, was one of the most attractive displays ever seen in this city, not only because it contained so many good things, but because so few indifferent plants and flowers were admitted to fill up vacant spaces and degrade the general average of excellence. The first object presented to the eye of the visitor on entering the hall was a mass of Cytisus some twelve feet high and nearly as wide at the base. The plants at the summit and sides were of *Cytisus Canariensis*, with long, arching and pendulous branches, while the plants at the base were specimens of *C. racemosa*, of bushy and upright habit, and they gave to the whole the needed suggestion of stability. The plants were all remarkably well-flowered and the foliage was of the cleanest and freshest. Some of the plants of the type of *C. racemosa* were seedlings, and the color of the racemes of their flowers varied from nearly white to deepest yellow, and the foliage of some of them was a pleasing glaucous green. Mr. James Dean, of Bay Ridge, New York, who exhibited these plants, is said to have some seedlings of very distinct habit, which are well worth propagating as garden varieties. Mr. Dean's collection of Azaleas, too, was a noteworthy one, and he took prizes for Rhododendrons (specimens of Prince Camille de Rohan being exceptionally good) and for a remarkable group of Hydrangeas.

The centre of the hall was occupied by the prize group of Palms and decorative plants, arranged for effect, with a superb specimen of *Acanthophœnix crinita* at the summit. The mass was about fifteen feet high, and its general shape was conical. It was composed throughout of good material, and some of the plants, as, for instance, a *Dieffenbachia imperialis*, were exceptionally fine. This group was arranged with excellent taste by Mr. A. W. Bennet, gardener to William Brown, Esq., of Flatbush, Long Island. Of the three other groups which competed for this prize, that of Mr. Richard Brett, gardener to J. B. Colgate, Esq., of Yonkers, secured second prize. Besides these two prize-groups the collections of Mr. Brown and Mr. Colgate furnished many other attractive features of the exhibition. No better Calceolarias were ever seen in this city than those sent from the former, while the Palm which attracted most attention was an immense Livistona from the same place. From Mr. Colgate's collection came the first prize Cycas, the best group of Ferns, and some fine Azaleas naturally grown.

In the rear of the stage fine specimens of Areca and Pritchardia showed in pleasant relief against the light-colored paper, but this background did not help the Orchids from the same collection—that of Messrs. Pitcher & Manda, of the United States Nurseries. These Orchids were very numerous, among them being 300 Cypripediums, including many choice hybrids. The White *Lycaste Skinneri*, *Cœlogyne cristata alba*, some distinct forms of *Cattleya Trianæ*, *Odontoglossum Rookerianum* and a large specimen of *Oncidium ampliatum* were among the best. Besides the Orchids, Messrs. Pitcher & Manda's display included a tank of aquatics, some new Anthuriums, and a large general collection of greenhouse plants, and the best Tree Fern in the exhibition.

It should be added that the arrangement of the plants in the main hall was admirable throughout. Each group had abundant room, so that its best possible effect was secured, and the plants as a rule were distributed with a view to the general appearance of the exhibit, so that the collection, as a whole, looked remarkably well from the galleries and the boxes. The disposition of the plants on the floor was a great improvement on the usual plan of placing them on high stages.

In the lower room of the Lyceum there was a great display of Roses of all kinds, both in cut flowers and in pots. Taken as a whole, they were the best ever seen in New York. The wonder among them all was a group of cut flowers sent by Mr. H. Dale, of Brampton, Ontario, including Niphetos, Sunset, Bride and Catherine Mermet. They were of perfect form and good substance, while in size they were almost monstrous, being nearly as large as Pæonies. Among the potted Roses the most interesting was a large group of Baroness Rothschild and Magna Charta, shown by John Henderson & Co. The principal prizes in the Roses were taken by John N. May, F. R. Pierson, Julius Roehrs, Rudolph Asmus, Ernst Asmus and John H. Taylor. Besides the usual commercial Dutch bulbs, hardy flowers were not shown in great profusion. Some hardy shrubs forced into bloom, including Lilacs, Deutzias, Spiræas, etc., were there, but, although many of them were well flowered, it is very evident that some plants, like *Spiræa Thunbergii* and *S. prunifolia*, were never intended to be crowded out of their season. Among these shrubs were some choice hardy plants from the collection of Messrs. Pitcher & Manda, which were well flowered without overmuch forcing. Among the best of these were Tree Pæonies and Yellow Day Lilies. Hiding under the larger plants were some pots of choice Alpines, which were a very pleasant surprise to those who found them. Among them were well-flowered plants of *Frittilaria Armenna*, *Primula denticulata*, *Myosotis elegantissima*, *Aubrietia Græca* and *Arabis alpina*.

The Carnations gave renewed proof of the improvement which is steadily going on in the size and quality of these beautiful flowers. The new variety, Sea-gull, exhibited by E. G. Hill & Co., of Indianapolis, secured the silver cup offered for competition in this class. Grace Darling, another new variety, deserves special mention as an advance in good qualities over the favorite Grace Wilder. The new flower is a trifle larger, a deeper pink, and it is unusually fragrant. Flowers of the variety Mrs. Fisher, shown by Lombard, and general collections by such well-known growers as H. E. Chitty and Rudolph Asmus, were all worthy of special mention.

Notes.

More than five thousand dollars have been subscribed toward the monument to Audubon, the naturalist, which it is proposed to erect in this city.

It is said that the finest sherry wines yet produced in this country have been made in Arizona, and that this territory

promises to be to the United States what Spain is to Europe in the production of wines of this quality.

In a bulletin from the Iowa Experiment Station it is stated that since there is a concentration of albuminoids near the eyes of ripe potatoes, and since albuminoids are much more nutritious than starch, therefore potatoes should always be cooked with their skins on.

Spiræa confusa is a pretty pot-shrub which should prove of good service as a source of flowers for Easter. Messrs. Veitch exhibited a group of it in flower at a late exhibition of the Royal Horticultural Society; the plants were about two feet high, compact, yet elegant, and thickly clothed with hawthorn-like bunches of white flowers.

California truck-farmers and grape-growers are complaining about the census bulletins. They declare that a single county alone has more acres in Asparagus than is credited to the whole state, while Egg Plant, which goes eastward by the car-load, and other vegetables extensively grown, have no mention whatever. In the viticultural bulletin Californians assert that figures which were used several years ago are reproduced; that in Fresno County, for example, which, is credited with less than 20,000 acres in vines, there are really more than 50,000 acres in wine and raisin grapes.

Professor Hilgard states in a late bulletin that there is little doubt that, in the valleys of the southern parts of California, Ramie can be grown, with success and with profit, as soon as satisfactory methods of marketing are devised. He reminds planters, however, that a crop that will produce, in one season, ten tons of dry stalks to the acre must be exhausting, and that the fibre sold represents a larger proportion of the plant-food in the soil than does the fibre of the Cotton-plant. This means that proper care must be taken to return the refuse of the plant to the soil, or that fertilizers must be purchased.

Mr. T. S. Gold, writing in the *American Garden*, under the heading, "Apple Orchards of My Youth," says that the first commercial orchard he ever saw "was in Dutchess County, New York, planted about 1830 by a Mr. Constock. There were some twenty or thirty acres all of one variety, the English or Poughkeepsie Russet, for the New York market." Before the year 1835, he adds, "I had never heard of an apple failure. Then there came a succession of cold springs, blasting the blossoms, and ice-storms breaking the trees, so that with the incoming of the temperance reformation, doing away with cider, many orchards were cut down and few new ones planted for twenty years."

Chrysanthemums in April are curiosities, and a few plants in flower, shown by Pitcher & Manda at the exhibition in this city last week, attracted some attention. One of them with flowers in the shape of a bird's nest, and named Ulysses, was a novelty. Mr. Manda says that these plants have had no different care from the others in their large collection, but they seem to have the peculiarity of coming into bloom soon after they are struck, without regard to the season. Suckers from the plants on exhibition, only four or five inches high, showed flower-buds at their extremities, and perhaps these plants are the forerunners of a class which will give flowers all the year round.

A very useful little book is "The Reader's Guide in Economic, Social and Political Science," edited by R. R. Bowker and George Iles. Mr. Iles, however, is credited with the great bulk of the editorial work, and, as might be expected, the work is done exceptionally well. The book is a classified bibliography with descriptive notes, which will enable any one to find out, by the help of its very complete index, where the best reading can be had on any of the subjects within its range. Readers of Garden and Forest will be particularly interested in knowing that forestry is taking its place among the subjects of economic interest, and that, in addition to a good list of writings on the subject, which cover two pages, there are allusions to the subject scattered through the "Reader's Guide" in many other places, as, for example, in the brief summary of Mr. H. C. Adams' essay on Public Debts, it is noticed that reasons are there given why state governments should take in hand the care of their forests.

We have received the first part of the *Flora Franciscana*, "an attempt to classify and describe the vascular plants of middle California," from the author, Edward L. Greene, Assistant Professor of Botany in the University of California, who has had unexcelled opportunities for studying the flora of California. The arrangement of the families, the work beginning with the *Leguminosæ*, differs essentially from that adopted by most botanists, from the majority of whom Professor Greene differs also in his limitations of some genera, like Prunus and Pyrus, the former being redivided into Amygdalus (of Theophrastus), Prunus and Cerasus, and the latter, so far as California is concerned, into Sorbus (of Theophrastus) and Malus. Several new species are proposed. While botanists may disagree with Professor Greene's views upon classification, they will find in this new book of his proof of his great industry, and much valuable information about the plants described of a character which can be acquired only by long familiarity with them in a living state, and therefore of great value and importance.

The *Kew Bulletin* for March contains a valuable list of the Orchids which flowered at Kew in 1890. It enumerates 766 species and varieties, and is published to afford data as to the time and duration of the flowering period of Orchids cultivated in England. In the Kew collection no attempt is made, by the cultivation of a large number of examples, to give prominence to the most showy-flowered. On the other hand, as the *Bulletin* explains, every effort is made to obtain and cultivate even small and unattractive kinds of scientific interest, such as the ordinary collector would consider beneath his notice. In the limited space available for Orchids as comprehensive a collection of species as possible is aimed at. Consequently, while there is never a great display of Orchid-flowers at Kew, at no time of the year is the collection wanting in flower interest. Thus, while the highest number of species flowered in any one month was 125 in May, the lowest was eighty-five in January. The average for each month was a fraction over 100. In 1811 the number of species in cultivation at Kew was only thirty-seven. There are now 1,342 species, comprised in 158 genera. These figures do not include 174 varieties, and over 100 undetermined plants. The collection is kept up by means of exchange, and a small outlay, about £20 annually, for plants which can be obtained only by purchase.

In his famous "History of Plymouth Plantation" Governor Bradford tells how the Pilgrims first made acquaintance with Indian Corn, and with the beans still so generally associated with it in New England kitchens. The discovery was made while they were searching for "a place of habitation" on Cape Cod, before the final settlement at Plymouth. On the 15th of November, 1620, an exploring party landed at a spot supposed to have been within a furlong of the end of Long Point, and the following day, after a trying experience amid "schuch thickets as were ready to tear their cloaths & armore in peeces . . . at length they found water & refreshed themselves, being ye first New-England water they drunke of, and was now, in thir great thirste, as pleasante unto them as wine or bear had been in for-times." Soon after they came upon a place where the Indians had formerly planted Corn, and upon some of their graves. "And proceeding furder they saw new-stuble wher corne had been set ye same year," and in deserted huts, among other things, found "faire Indean baskets filled with corne, and some in eares, faire and good, of diverce colours, which seemed to them a very goodly sight, (haveing never seen any schuch before)." Returning to the ship, they "tooke with them parte of ye corne, and buried up ye rest, and so, like ye men from Escholl, carried with them of ye fruits of ye land & showed their breethren; of which & their returne, they were marvelusly glad, and their harts incouraged." Going once more to the same spot they found two deserted Indian houses, and "also ther was found more of their corne, & of their beans of various collours. The corne & beans they brought away," intending to pay the Indians for them when "they should meete with any of them," as happened about six months later "to their good contente. And here is to be noted a spetiall providence of God, & a great mercie to this poore people, that hear they gott seed to plant them corne ye next year, or els they might have starved, for they had none, nor any liklyhood to get any till ye season had beene past (as ye sequell did manyfest)." In the month of April, 1621, a friendly Indian, named Squanto, helped them to plant their corn, "showing them both ye manner how to set it, and after how to dress & tend it. Also he tould them excepte they gott fish and set with it (in these old grounds) it would come to nothing, and he showed them yt in ye middle of Aprill they should have store enough come up ye brooke"; and all these things they found true "by triall & experience." Then Bradford adds, with the quaintest carefulness not to commit himself upon a doubtful point, "Some English seed they sew, as wheat and pease, but it came not to good, eather by ye badnes of ye seed, or latenes of ye season, or both, or some other defecte."

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